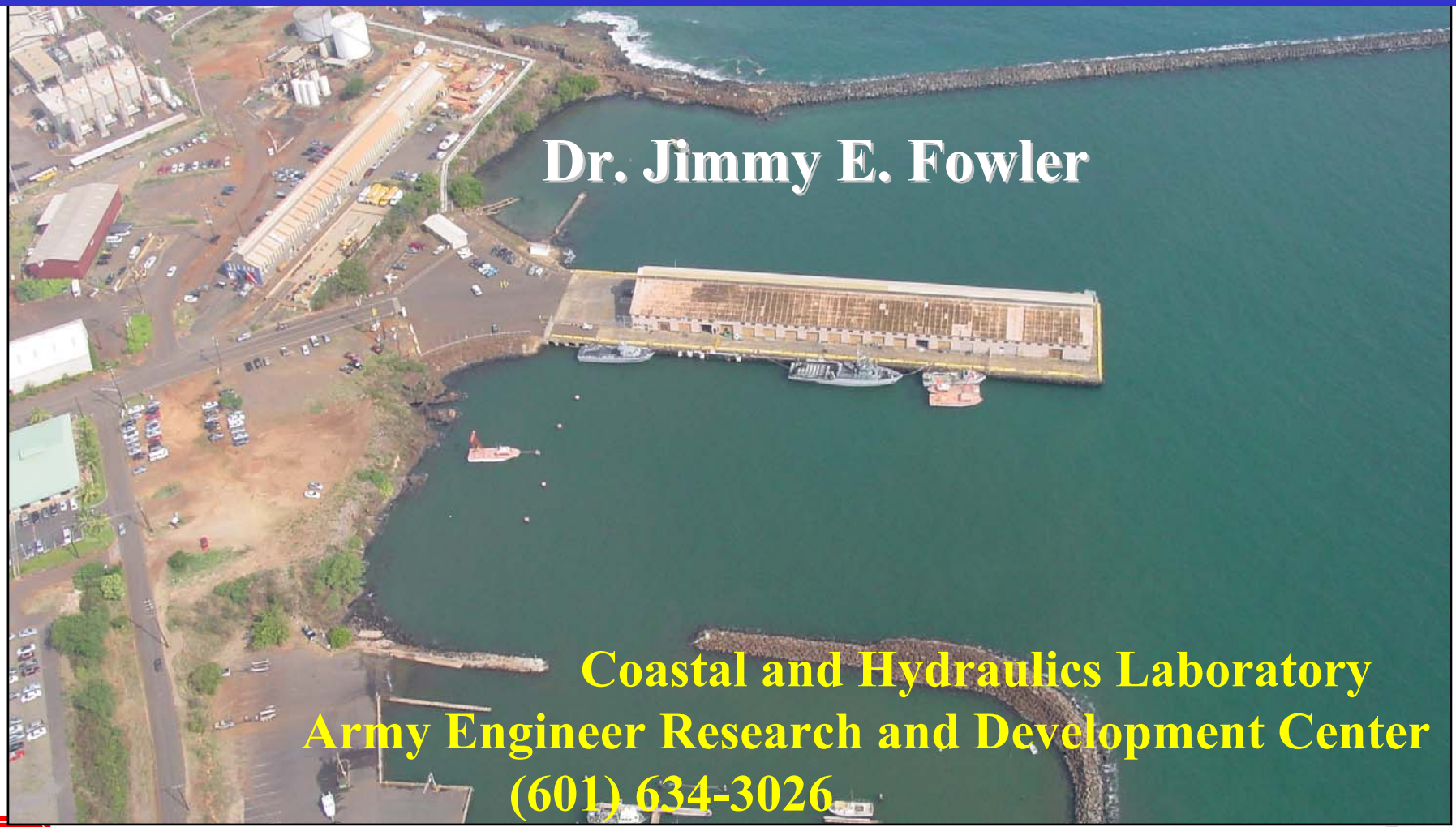
Rapid Port Enhancement for the TSV Overview



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Rapid Port Enhancement for the TSV

- **New Army Science and Technology Objective (STO # IV.EN.2003.04)**
- **Presently only funded at 6.2 level**
- **4 year effort started in FY 03**

Sponsor Agencies:

DPMO, MSBL

RPE Team

- Coastal & Hydraulics Laboratory – ERDC
- Geotechnical & Structures Laboratory – ERDC
- Quantum Engineering Design, Inc
- Alion Inc.

Additional Members

Director, Internal Pressures (DIP)

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DIPs, Static Hydrobeam Tube Systems (DIP SHTS)

RPE R&D Program

RPE R&D Components

Presently Funded Efforts:

- Lightweight Modular Causeway Development
- Small Sea Port Characterization Methodology
- Throughput Model Development

Proposed Unfunded Efforts:

- Near Shore Breakwater
- Expedient Dredging
- Rapid Pier Repair/Upgrade
- Waterside Security

RPE R&D Major Milestones

Rapid Port Enhancement for the Theater Support Vessel

FY04: Small Scale Lab Demonstration

FY 04 Integration of Egress/Ingress Port Algorithms

FY05: Fabrication of Scaled Causeway Model for Field Demo

Integration of Algorithms into Small Port Throughput Model

FY06: Scaled Field Demonstration of Causeway System and Modeling Capabilities/Small Port Tool-kit

FY06: Lightweight Causeway System ready for full scale (6.3) program/demonstration

Throughput Model Development

POCs: Green, Debra and Greg

Key Milestones:

’03 Cluster Analysis of Small Ports

’04 Computational framework for land/sea-based throughput analysis

’05 Link sea/land modules for Small Port Throughput Model

’06 Validate Small Port Throughput Model

Small Port Throughput Model

Korean Theater Scenario
Okinawa, Japan to Korean East & West Coast Alternatives

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Small Port Characterization Methodology

POC: Dr. Resio

Key Milestones:

'04 Small Port Characterization/Classification System (SMPCCS)

'05 Inferential System for Applying SMPCCS when data is lacking

'06 Small Port Classification/Assessment Module

Lightweight Modular Causeway Section Development

POCs: Resio, Donald
Fowler, Jimmy
Pratt, James
Ray, James
Bevins, Tommy
Plackett, Mike

- **Many more small/medium ports available to TSV/HSV/HSC**

- **Many will not be immediately offload compatible and will require upgrade or access improvements**

- **Existing/planned causeway systems not transportable by TSV**

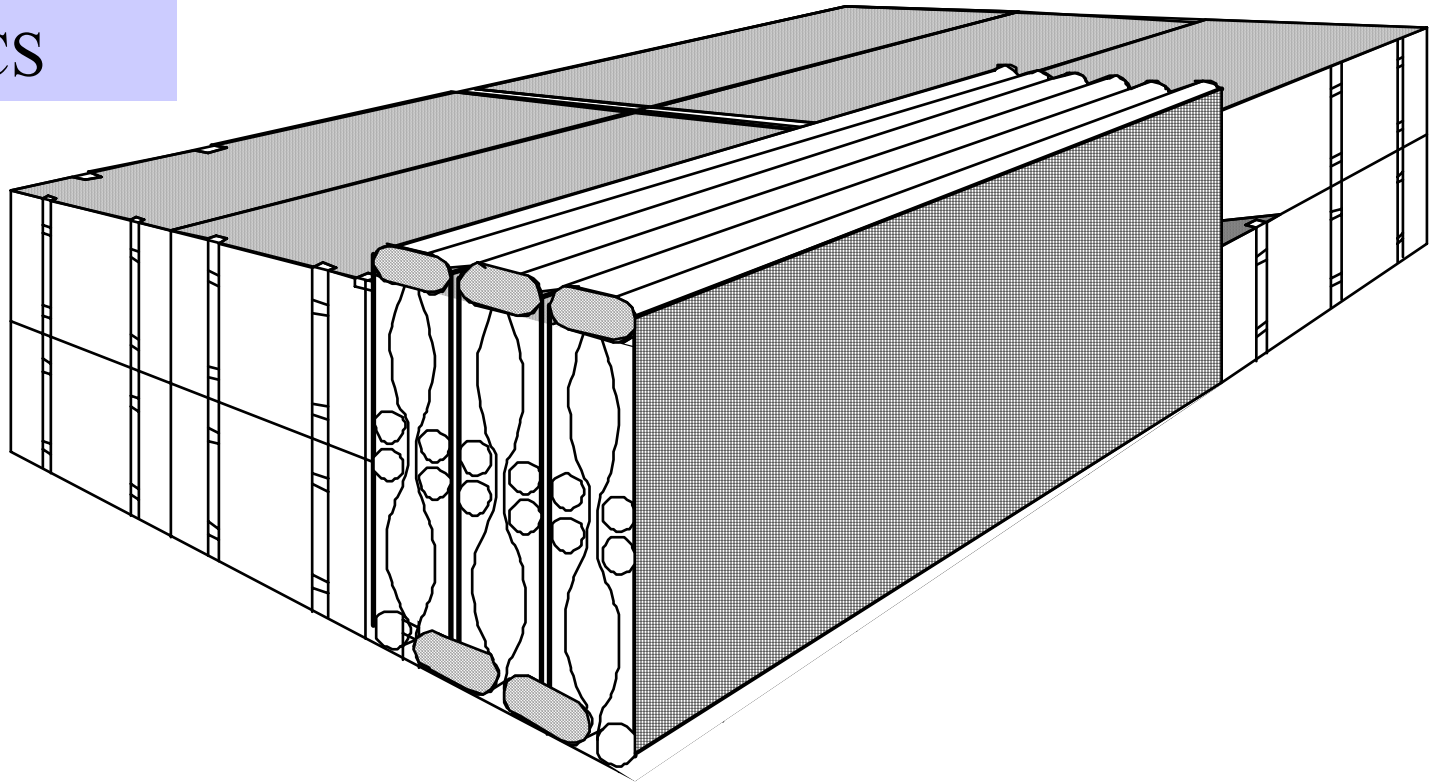
Fixed Steel/Pneumatic Causeway Elements

	Fixed Steel	Pneumatic
Volume	In-storage size must be sufficient to float causeway elements plus load	In-storage size must be sufficient to float causeway element only
Strength/Weight	Deck load must be conveyed to sides and bottom - requires thick deck/internal bracing - more freeboard means significantly more weight	Deck load is supported on top of pneumatic tube - greatly reduces deck thickness requirement - more freeboard does not require significantly more weight
Draft	Fixed weight/volume means relatively large draft for beaching large capacity causeway elements	Reduced volume during deployment means less draft for beaching large capacity causeway elements
Configuration of traffic surface	Depends on bottom conditions/slopes at land-sea interface	Can be adjusted to improve trafficability

LMCS Comparison

80 ft MCS

60 ft LMCS



LMCS = 23% of the MCS storage volume
= 33% of the MCS Weight
=100% of the MCS payload capacity

Lightweight Modular Causeway Development

POC: Resio/Fowler/Ray

Planned Accomplishments with existing funds:

FY04: Small Scale Lab/Field Demonstration

FY05: Fabrication of Small Scale Causeway Model for Field Study

FY06: Small-Scale Field Demonstration of Causeway System and Modeling Capabilities

FY06: LMCS ready for transition to 6.3 Full Scale Development

FY09: Transition to SDD

FY10: Initial procurement of Lightweight Modular Causeway System

Other scenarios could accelerate procurement schedule

Concept Still Needs Work!

- Puncture/Wear Resistance
- Roll Stability
- Deployment/Recovery
- Ramps and Ramp Loads
- Mooring
- Trafficability/Wear Surface
- TSV-Interface Issues
- Life-Cycle Costs
- Force Structure Issues


Pratt: Design Considerations
Bevins: Superstructure Concepts
Plackett: Substructure Concepts
Photo: Duck, NC by D. Green

IPPD Team is being formed.

DEMO